AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An object information processing apparatus for obtaining object information from input image data comprising pixels, comprising:

an object determination section for determining whether or not each pixel is a part of an object to be extracted by comparing color information indicating a color of the pixel with a predetermined reference value for the object; ~~and~~

an object information retaining section for retaining coordinate data of the pixel as the object information if the pixel has been determined by the object determination section to be a part of the object to be extracted; and

a noise removal section for removing noise from a result of determination by the object determination section,

wherein the noise removal section comprises,

a shift register section for successively retaining the result of determination by the object determination section, the shift register section including a plurality of shift register units corresponding to a number of determination operations of the object determination section, and

a noise removal determination section for determining whether or not a predetermined number or more of a plurality of results of the shift register section are equal to one another to determine whether or not the plurality of results are noise, and wherein

the predetermined number or more of the plurality of results of the shift register section represents a majority of shift register units of the shift register section, and

if the majority of shift register units have the same result for the pixel, the pixel is determined to be part of an object to be extracted, but not noise.

2. (Original) An object information processing apparatus according to claim 1, wherein the object determination section comprises:

a first to an n^{th} comparison sections for determining whether or not the color information of each pixel of the input image satisfies a first to an n^{th} object conditions, respectively (n: natural integer); and

an AND circuit for receiving n outputs of the first to the n^{th} comparison sections.

3. (Original) An object information processing apparatus according to claim 1, further comprising:

an image data conversion section provided before the object determination section, for converting an UYVY value of the input image data to an HSV value,

wherein the object determination section compares the HSV value of each pixel output by the image data conversion section with the predetermined reference value to determine whether or not the pixel is a part of the object to be extracted.

4. (Original) An object information processing apparatus according to claim 3, wherein the image data conversion section has a first conversion table for converting an UV value of the input image data to an H (hue) value, and a second conversion table for converting the UV value of the input image data to an S (saturation) value, and the image data conversion section outputs a Y value of the input image as a V (lightness) value.

5. (Canceled)

6. (Canceled)

7. (Original) An object information processing apparatus according to claim 1, further comprising:

an object inclusion relation determination section for determining whether a pixel of the input image data which has been determined by the object determination section to be a part of an object to be extracted is a part of an already detected object or of a new object which has not been detected, and generating coordinate data of the pixel,

wherein the object information retaining section retains the coordinate data generated by the object inclusion relation determination section for each detected object.

8. (Original) An object information processing apparatus according to claim 7, wherein the object inclusion relation determination section generates four coordinate points: coordinates having maximum X, coordinates having minimum X, coordinates having maximum Y, and coordinates having minimum Y, where coordinates of the object are (X, Y).

9. (Original) An object information processing apparatus according to claim 8, wherein when a pixel of the input image data appears which has been determined by the object determination section to be a part of an object to be extracted, the object inclusion relation determination section determines whether or not there is another pixel satisfying the same object condition, and when there is another pixel satisfying the same object condition, the other pixel is determined to be a part of the object and the coordinate data (X, Y) of the object is updated.

10. (Original) An object information processing apparatus according to claim 9, wherein when a pixel of the input image data appears which has been determined by the object determination section to be a part of an object to be extracted and the object inclusion relation determination section determines that there is no pixel satisfying the same object condition, the pixel is determined to be a part of a newly detected object and information about the pixel is stored in the object information retaining section corresponding to the newly detected object.

11. (Original) An object information processing apparatus according to claim 1, wherein when a plurality of object extraction conditions are provided, the object information retaining section retains a condition matching flag indicating which object condition is satisfied as a part of the object information.

12. (Original) An object information processing apparatus according to claim 1, wherein the object information retaining section retains one frame of object information of an object which has been determined to be an object to be extracted.

13. (Currently Amended) An image processing system, comprising:

an object information processing apparatus for obtaining object information from input image data comprising pixels, comprising:

an object determination section for determining whether or not each pixel is a part of an object to be extracted by comparing color information indicating a color of the pixel with a predetermined reference value for the object; ~~and~~

an object information retaining section for retaining coordinate data of the pixel as the object information if the pixel has been determined by the object determination section to be a part of the object to be extracted;

a noise removal section for removing noise from a result of determination by the object determination section,

wherein the noise removal section comprises,

a shift register section for successively retaining the result of determination by the object determination section, the shift register section including a plurality of shift register units corresponding to a number of determination operations of the object determination section, and

a noise removal determination section for determining whether or not a predetermined number or more of a plurality of results of the shift register section are equal to one another to determine whether or not the plurality of results are noise, and wherein

the predetermined number or more of the plurality of results of the shift register section represents a majority of shift register units of the shift register section, and

if the majority of shift register units have the same result for the pixel, the pixel is determined to be part of an object to be extracted, but not noise;

an image data output apparatus for outputting image data into the object information processing apparatus; and

a control apparatus for controlling the object information processing apparatus and the image data output apparatus.

14. (Original) An image processing system according to claim 13, wherein the image data output apparatus is provided with an image pickup device for taking an object image, and coordinate data of the object indicating a location of the object is coordinate data on the image pickup device.

15. (Original) An image processing system according to claim 13, wherein the control apparatus comprises a processing operation section for reading out object information stored in the object information processing apparatus and performing a processing operation for recognizing an object contained in image data.

16. (Original) An image processing system according to claim 15, wherein the processing operation section reads out the object information from the object information processing apparatus on a frame-by-frame basis.

17. (Original) An image processing system according to claim 16, wherein the processing operation section reads out the object information, which has been extracted on a frame-by-frame

basis, from the object information processing apparatus and compares the object information between frames to detect movement or change of an object.

18. (Original) An image processing system according to claim 17, wherein the control apparatus recognizes that the object is moving in a predetermined direction when coordinate data of the object is changed in the predetermined direction between each of a plurality of consecutive frames.

19. (Original) An image processing system according to claim 17, wherein the control apparatus recognizes that the object is looming toward a viewing site when a coordinate location of the object is not changed and a size of the object is expanding between each of a plurality of consecutive frames in coordinate data of the object.

20. (Original) An image processing system according to claim 17, wherein the control apparatus recognizes that the object is moving away from a viewing site when a coordinate location of the object is not changed and a size of the object is shrinking between each of a plurality of consecutive frames in coordinate data of the object.

21. (Original) An image processing system according to claim 17, wherein when the object has at least two colors, the control apparatus recognizes a behavior of the object when each color of the object is moved between each of a plurality of consecutive frames.

22. (Currently Amended) A game apparatus, which recognizes a behavior of an object using an image processing system, wherein the image processing system comprises:

an object information processing apparatus for obtaining object information from input image data comprising pixels, comprising:

an object determination section for determining whether or not each pixel is a part of an object to be extracted by comparing color information indicating a color of the pixel with a predetermined reference value for the object; ~~and~~

an object information retaining section for retaining coordinate data of the pixel as the object information if the pixel has been determined by the object determination section to be a part of the object to be extracted;

a noise removal section for removing noise from a result of determination by the object determination section,

wherein the noise removal section comprises,

a shift register section for successively retaining the result of determination by the object determination section, the shift register section including a plurality of shift register units corresponding to a number of determination operations of the object determination section, and

a noise removal determination section for determining whether or not a predetermined number or more of a plurality of results of the shift register section are equal to one another to determine whether or not the plurality of results are noise, and wherein

the predetermined number or more of the plurality of results of the shift register section represents a majority of shift register units of the shift register section, and

if the majority of shift register units have the same result for the pixel, the pixel is determined to be part of an object to be extracted, but not noise;

an image data output apparatus for outputting image data into the object information processing apparatus; and

a control apparatus for controlling the object information processing apparatus and the image data output apparatus, and for recognizing a behavior of the object based on the obtained object information.

23. (Currently Amended) An image processing method, comprising the steps of:

outputting image data from an image data output apparatus to an object information processing apparatus;

converting a UYVY value of the input image data to an HSV value using the object information processing apparatus, comparing the HSV value of each pixel with a reference value provided for an object to be extracted to determine whether or not the pixel is a part of the object to be extracted, ~~and~~ storing coordinate data of the pixel which has been determined to be a part of the object to be extracted as object information on an object-by-object basis, and successively retaining in a shift register the result of determination of whether the pixel is a part of the object to be extracted, the shift register comprising a plurality of shift register units corresponding to a number of determination operations; and

reading the object information stored in the object information processing apparatus using a processing operation section of a control apparatus on a frame-by-frame basis and recognizing an object contained in image data based on the object information,

wherein if a majority of the shift register units have the same result for the pixel, the pixel is determined to be part of an object to be extracted, but not noise.

24. (Original) An image processing method according to claim 23, wherein the processing operation section of the control apparatus reads out the object information, which has been extracted on a frame-by-frame basis, from the object information processing apparatus and compares the object information between each frame to detect movement or change of an object.